

System Board D2352 for TX600 S3/RX600 S3

Technical manual

Comments... Suggestions... Corrections...

The User Documentation Department would like to know your opinion of this manual. Your feedback helps us optimize our documentation to suit your individual needs.

Fax forms for sending us your comments are included in the back of the manual.

There you will also find the addresses of the relevant User Documentation Department.

Certified documentation according to DIN EN ISO 9001:2000

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2000.

cognitas. Gesellschaft für Technik-Dokumentation mbH
www.cognitas.de

Copyright and Trademarks

Copyright © 2006 Fujitsu Siemens Computers GmbH.

All rights reserved.

Delivery subject to availability; right of technical modifications reserved.

All hardware and software names used are trademarks of their respective manufacturers.

Contents

1	Introduction	1
2	Important notes	3
2.1	Notes on safety	3
2.2	CE Certificate	6
2.3	Environment Protection	7
3	Features	11
3.1	Overview	11
3.2	Main memory	14
3.3	PCI bus	15
3.4	Screen resolution	16
3.5	Temperature / system monitoring	16
3.6	Connectors and jumpers	18
3.6.1	External connectors	20
3.7	RoMB	21
4	Replacing the lithium battery	23
	Abbreviations	25

1 Introduction

This technical manual describes the system board D2352, which can be equipped with up to four Intel® processors.

Further information about drivers is provided in the readme files on the supplied *ServerSupport* or *ServerStart* CDs.

You will find further information in the manual "D2352 Setup Utility".

Notational conventions

The meanings of the symbols and fonts used in this manual are as follows:

<i>italics</i>	indicates commands, menu items, file and path names or software programs
fixed font	indicate system output on the monitor
semi-bold fixed font	indicates values to be entered through the keyboard
Key symbol	indicates keys according to their representation on the keyboard If capital letters are to be entered explicitly, then the Shift key is shown, e.g. SHIFT - A for A. If two keys need to be pressed at the same time, then this is shown by placing a hyphen between the two key symbols.
"quotation marks"	indicates names and terms that are being emphasized.
►	indicates an operation that is to be performed
 CAUTION!	indicates warnings, which, if ignored, will endanger your health, destroy the system or lead to the loss of data.
	indicates additional information, notes and tips

Table 1: Notational conventions

2 Important notes

In this chapter you will find essential information regarding safety when working with the system board.



CAUTION!

With the system board installed you must open the system to access the system board. How to dismantle and reassemble the system is described in the Options Guide accompanying your system.

2.1 Notes on safety



CAUTION!

- The actions described in these instructions should only be performed by authorized, qualified personnel. Equipment repairs should only be performed by qualified staff. Any failure to observe the guidelines in this manual, and any unauthorized openings and improper repairs could expose the user to risks (electric shock, fire hazards) and could also damage the equipment. Please note that any unauthorized openings of the device will result in the invalidation of the warranty and exclusion from all liability.
- Transport the device only in the antistatic original packaging or in packaging that protects it from knocks and jolts.
- Only install expansions that are allowed for the system board. If you install other expansions, you may damage the requirements and rules governing safety and electromagnetic compatibility or your system. Information on which system expansions are suitable can be obtained from the customer service centre or your sales outlet.
- The warranty expires if the device is damaged during the installation or replacement of system expansions.



- Components can become very hot during operation. Ensure you do not touch components when making extensions to the system board. There is a danger of burns!
- Transmission lines to peripheral devices must be adequately shielded.
- To the LAN wiring the requirements apply in accordance with the standards EN 50173 and EN 50174-1/2. As minimum requirement the use of a protected LAN line of category 5 for 10/100 MBps Ethernet, and/or of category 5e for Gigabit Ethernet is considered. The requirements of the specification ISO/IEC 11801 are to be considered.
- Never connect or disconnect data transmission lines during a storm (lightning hazard).

Batteries



CAUTION!

- Incorrect replacement of lithium battery may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer.

It is essential to observe the instructions in [chapter “Replacing the lithium battery” on page 23](#).

- Do not throw batteries into the trash can. They must be disposed of in accordance with local regulations concerning special waste.
- The battery must be disposed of in accordance with local regulations concerning special waste.
- All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). In addition, the marking is provided with the chemical symbol of the heavy metal decisive for the classification as a pollutant:

Cd Cadmium

Hg Mercury

Pb Lead

Modules with electrostatic-sensitive components

Systems and components that might be damaged by electrostatic discharge (ESD) are marked with the following label:

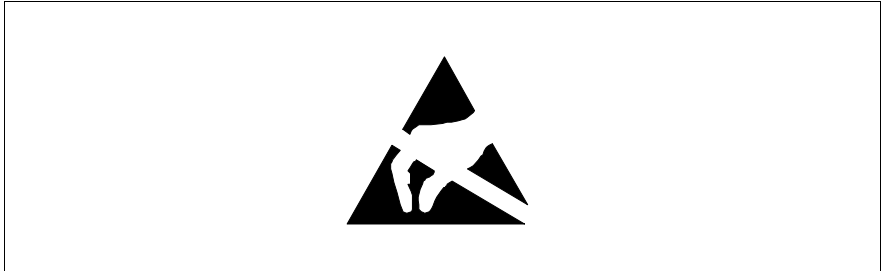


Figure 1: ESD label

When you handle components fitted with ESDs, you must observe the following points under all circumstances:

- You must always discharge yourself of static charges (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Remove the power plug from the power socket before inserting or removing boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.
- Use a grounding cable designed for this purpose to connect yourself to the system unit as you install/deinstall the board.
- Place all components on a static-safe base.



You will find a detailed description for handling ESD components in the relevant European or international standards (EN 61340-5-1, ANSI/ESD S20.20).

Notes about boards

- During installation/deinstallation of the system board, observe the specific instructions described in the service manual for the server.
- Remove the plug from the mains outlet so that system and system board are totally disconnected from the mains voltage.
- To prevent damage to the system board, the components and conductors on it, please take great care when you insert or remove boards. Take great care to ensure that extension boards are slotted in straight, without damaging components or conductors on the system board, or any other components, for example EMI spring contacts
- Be careful with the locking mechanisms (catches, centring pins etc.) when you replace the system board or components on it, for example memory modules or processors.
- Never use sharp objects (screwdrivers) for leverage.

2.2 CE Certificate



The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC "Electromagnetic compatibility".

Compliance was tested in a typical PRIMERGY configuration.

2.3 Environment Protection

Environmentally-friendly product design and development

This product has been designed in accordance with the Fujitsu Siemens Computers standard for “environmentally friendly product design and development”. This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of disassembly and recycling have been taken into account.

This saves resources and thus reduces the harm done to the environment.

Notes on saving energy

Devices that do not have to be on permanently should not be switched on until they need to be used and should be switched off during long breaks and on completion of work

Notes on packaging

Please do not throw away the packaging. You may need it later for transporting your system unit. If possible, the device should only be transported in its original packaging.

Notes on dealing with consumables

Please dispose batteries in accordance with local government regulations.

Do not throw lithium batteries into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

Notes on labeling plastic housing parts

Please avoid attaching your own labels to plastic housing parts wherever possible, since this makes it difficult to recycle them.

Returning used electrical and electronic devices in EU countries

- Separate collection

Users of electrical and electronic devices are obligated to collect used devices separately. Electrical (electronic) used devices may not be disposed of together with unsorted household refuse. The separate collection is a condition for reuse, recycling and utilisation of used electrical (electronic) devices, which ensures the protection of resources.

- Return and collection systems

Electrical (electronic) used devices from private households can be returned free of charge. To return your used device, please use the country-specific return and collection systems available to you (see [“Local contacts” on page 9](#)).

The return of used devices which pose a health or safety risk for human beings due to soiling during use may be refused.

- Reuse, recycling and utilisation

By actively using the offered return and collection systems, you make your contribution to the reuse, recycling and utilisation of electrical (electronic) devices.

- Effects on the environment and human health

Electrical (electronic) used devices contain parts which must be handled selectively according to the EU directive. Separate collection and selective treatment are the basis for environment-friendly disposal and the protection of human health.

- Meaning of the symbol "Crossed out rubbish bin on wheels"

Electrical (electronic) devices which are marked with one of the following symbols may not be disposed of with household refuse in accordance with the EU directive.

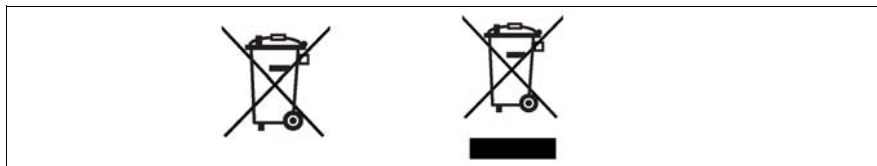


Figure 2: Symbols for electrical (electronic) devices

Returning batteries

Batteries which are marked with one of the following symbols may not be disposed of together with household refuse according to the applicable EU directive.

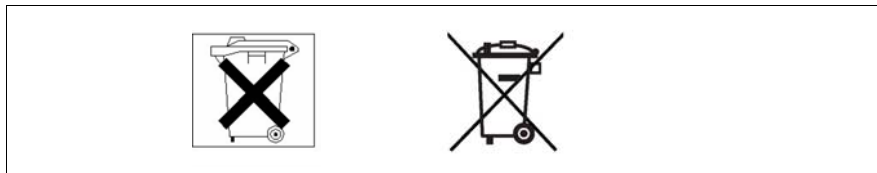


Figure 3: Symbols for batteries

With batteries containing harmful substances, the chemical symbol for the heavy metal contained is indicated below the waste bin.

Cd Cadmium

Hg Mercury

Pb Lead

The following applies to Germany:

- Private consumers can return batteries at the point of sale or the immediate vicinity thereof free of charge (exception: starter batteries).
- The final consumer is obligated to return defective or used batteries to the seller or to the return points established for this purpose.

Local contacts

For details on take-back and reuse of devices and consumables within Europe, contact your Fujitsu Siemens Computers branch office/subsidiary or our recycling center in Paderborn:

Fujitsu Siemens Computers
Recycling Center
D-33106 Paderborn
Germany

Tel. +49 5251 8 18010

Fax +49 5251 8 18015

Internet: www.fujitsu-siemens.com/recycling

3 Features

3.1 Overview

System board

- Up to four Intel® XEON MP dual-core processors
- Intel® E8501 chipset:
 - Intel® E8501 chipset Northbridge (TNB): has two shared 64-bit FSB interfaces configured for symmetric multiprocessing.
 - External Memory Board (XMB): provides support for DDR-2 memory.
 - PXH: provides support for PCI-X .
 - Intel® IOP332 I/O processor with Intel XScale® Microarchitecture: provides support for PCI-X and contains Intel XScale® technology to support RoMB (RAID on Motherboard).
 - Intel® 82801EB I/O controller Hub 5 (Southbridge) provides support for system BIOS, USB 2.0 and SATA.
- Advanced I/O architecture:
 - One hot-plug x8 PCI-Express slot
 - Three hot-plug x4 PCI-Express slots
 - One hot-plug 133 MHz, 64-bit PCI-X slot
 - Two 100 MHz, 64-bit PCI-X slots (not hot-plug)
- LSI Logic® 53C1030 LVD SCSI controller:
 - Dual independent U320 SCSI interfaces
 - 64-bit PCI-X 100 Mhz interface
- Integrated ATI Technologies Inc® Radeon 7000M with 16 MB embedded SDRAM

- USB 2.0 support:
 - Two ports at the rear of the chassis
 - Three ports at the front of the chassis
 - One port onboard

Main memory

- Up to 4 hot-plug memory boards with each 4 slots for main memory PC2-3200 DDRII/400 MHz, DIMM memory modules with 1 Gbyte, 2 Gbyte and 4 Gbyte
- Maximum 64 Gbyte of memory
- Memory mirroring function or memory RAID
- Optional hot-spare memory function
- Single Device Data Correction (SDDC) function (Chipkill™)

External connectors

- Front side (front panel):
 - 3x USB 2.0 ports
 - 1x VGA port (15 pin)
- Rear side (I/O shield):
 - 2x USB 2.0 ports
 - 1x VGA port (15 pin)
 - 1x RS-232-C interface (serial 9 pin)
 - 2x RJ45 LAN ports (onboard LAN)
 - 1x RJ45 LAN port (presently not used, reserved for future development)

BIOS features

- Intel® Platform Innovation Framework EFI BIOS
- MultiProcessor Specification 1.4
- Server Hardware Design Guide 3.0
- WfM 2.0
- IPMI V1.5
- ACPI 1.0b support

- Intel® RoMB BIOS
- LSI SCSI BIOS
- SATA support
- USB keyboard/mouse
- boot possible from:
 - CD/DVD-ROM
 - USB drive
 - LAN
 - hard disk
- console redirection support
- OEM logo
- CPU, Memory disable
- memory mirroring/RAID/spare support

Environmental protection

Battery in holder

Form factor

16.4" x 18.3"

3.2 Main memory

The system board offers four slots for hot-plug memory boards. Each memory board can be equipped with up to four memory modules (in two memory banks). The slots for main memory can be populated with 1 Gbyte, 2 Gbyte or 4 Gbyte DDR II/400 MHz DIMM memory modules. The maximum memory is 64 Gbyte.

ECC with memory scrubbing and with the Single Device Data Correction (SDDC) function is supported.



You will find the descriptions how to install a memory board in the Operating Manual of your server and how to install memory modules in the Option Guide of your server.

Memory board population

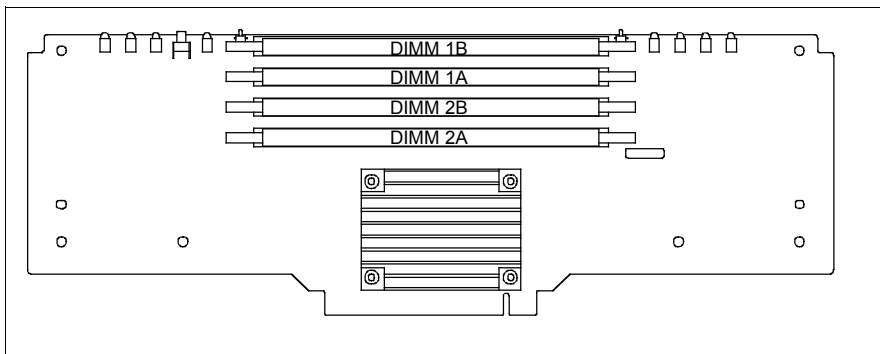


Figure 4: Memory board population

- Start with memory bank 1 (DIMM1A/DIMM1B).
- Install the memory modules in pairs. All DIMMs in a pair must be of the same type and size.
- The module capacity between pairs can differ: pair 2A/2B can be populated with two 1 Gbyte modules and pair 1A/1B with two 2 Gbyte modules.

3.3 PCI bus

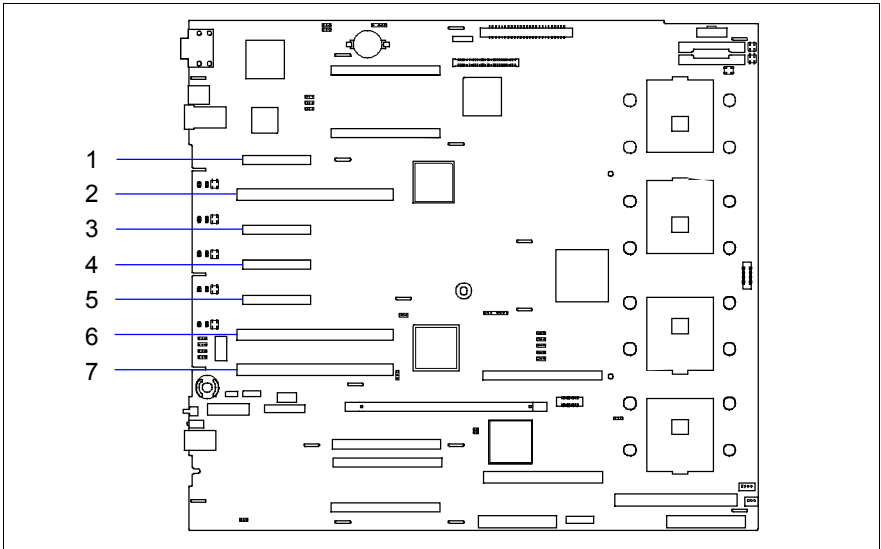


Figure 5: PCI slots

PCI slots

The following table shows an overview of the PCI slots:

PCI slot	Transfer rate	Description	Hot-plug
1	2500 Mbyte/s	PCI-Express x8 slot	yes
2	1064 Mbyte/s	PCI-X bus slot (133 MHz)	yes
3	1250 Mbyte/s	PCI-Express x4 slot	yes
4	1250 Mbyte/s	PCI-Express x4 slot	yes
5	1250 Mbyte/s	PCI-Express x4 slot	yes
6	800 Mbyte/s	PCI-X bus slot (100MHz)	no
7	800 Mbyte/s	PCI-X bus slot (100MHz)	no

Assignment of the PCI interrupts

The PCI interrupts are assigned automatically by the BIOS and no further settings are possible.

3.4 Screen resolution

Depending on the operating system used the screen resolutions in the following table refer to the screen controller on the system board. If you are using an external screen controller, you will find details of supported screen resolutions in the operating manual or technical manual supplied with the controller.

Screen resolution	Refresh rate (Hz)	Digital Display (Hz)	Max. number of colours
640x480	200	75	16,7 Mio.
800x600	200	75	16,7 Mio.
1024x768	200	75	16,7 Mio.
1152x864	150	-	16,7 Mio.
1280x1024	130	75	16,7 Mio.
1600x1200	90	60	16,7 Mio.

3.5 Temperature / system monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage caused by overheating. In addition, any unnecessary noise is also prevented by reducing the fan speed, and information is provided about the system status.

The temperature and system monitoring are controlled by an onboard controller.

The following functions are supported:

Temperature monitoring

Measurement of the processor temperature, measurement of the ambient temperature by a temperature sensor on the LED board.

Fan monitoring

Fans that are no longer available, blocked or sticky fans are detected.

Fan control

The fans are regulated according to temperature. Maximum speed if the housing cover has been opened.

Sensor monitoring

The removal of, or a fault in, a temperature sensor is detected. Should this happen all fans monitored by this sensor run at maximum speed, to achieve the greatest possible protection of the hardware.

Voltage monitoring

When voltage exceeds warning level high or falls below warning level low an alert will be generated.

System Event Log (SEL)

All monitored events of the system board are recorded in the System Event Log. They could be retrieved after a system reboot via ServerView.

3.6 Connectors and jumpers

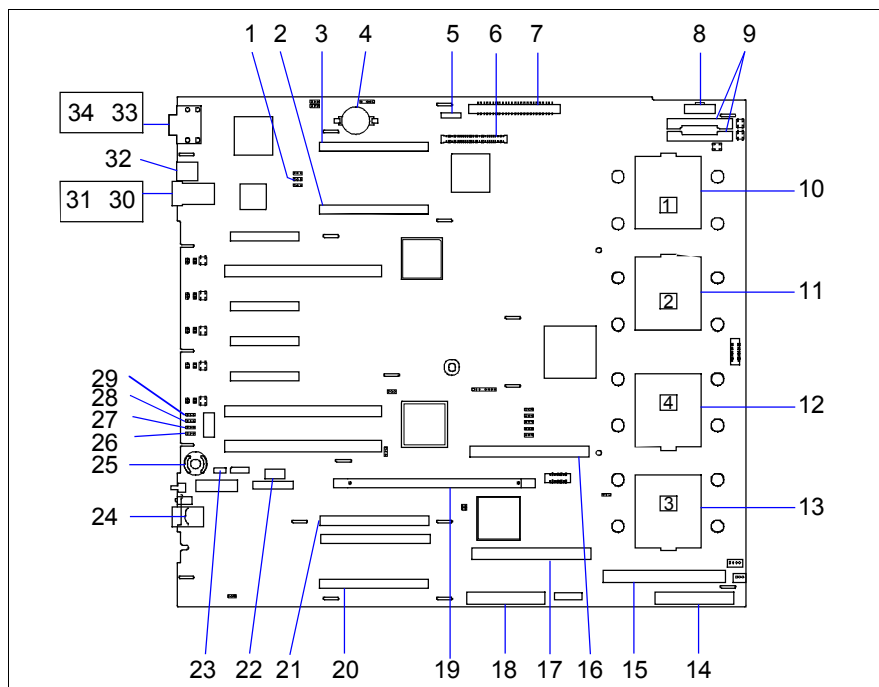


Figure 6: Schematic overview of the system board D2352

- | | |
|------------------------------|---|
| 1 = J8C2 (jumper) | 12 = Processor socket 4 |
| 2 = Memory board connector B | 13 = Processor socket 3 |
| 3 = Memory board connector A | 14 = SCSI connector channel A |
| 4 = Battery | 15 = VRM 9.1 connector (for future use) |
| 5 = SATA connector | 16 = VRM 10.2 connector (CPU 4) |
| 6 = BMC connector | 17 = VRM 10.2 connector (CPU 3) |
| 7 = Front panel connector | 18 = SCSI connector channel B |
| 8 = PDB signal connector | 19 = RAID DDR2 DIMM connector (RoMB) |
| 9 = DC power connectors | 20 = Memory board connector D |
| 10 = Processor socket 1 | 21 = Memory board connector C |
| 11 = Processor socket 2 | 22 = USB onboard connector |

23 = IPMI connector	29 = J4A4 (jumper)
24 = GCM connector (not used)	30 = LAN 1 (top)
25 = RAID Activation Key (RoMB)	31 = LAN 2 (bottom)
26 = J4A1 (jumper)	32 = Dual USB connector
27 = J4A2 (jumper)	33 = Serial connector (top)
28 = J4A3 (jumper)	34 = Video connector (bottom)

Settings with jumpers

The system board is supplied with all jumpers set on the following positions.

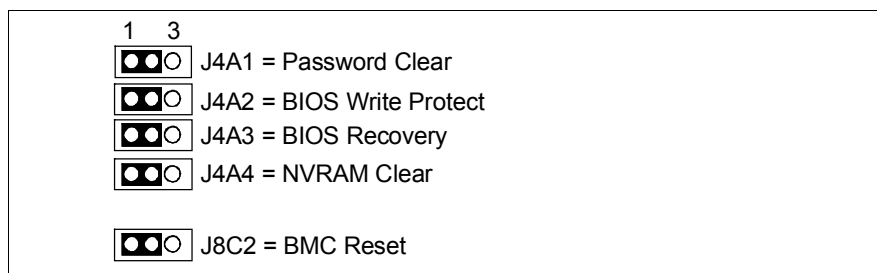


Figure 7: Jumper default settings

J4A1 (26) - Password Clear

- 1-2 Password enabled
- 2-3 Password disabled/cleared

J4A2 (27) - BIOS Write Protect

- 1-2 BIOS unprotected
- 2-3 BIOS write protected

J4A3 (28) - BIOS Recovery

- 1-2 Normal boot
- 2-3 BIOS recovery

J4A4 (29) - NVRAM Clear

1-2 NVRAM settings are not cleared

2-3 NVRAM settings cleared

J8C2 (1) - BMC Reset

1-2 BMC enabled

2-3 BMC disabled

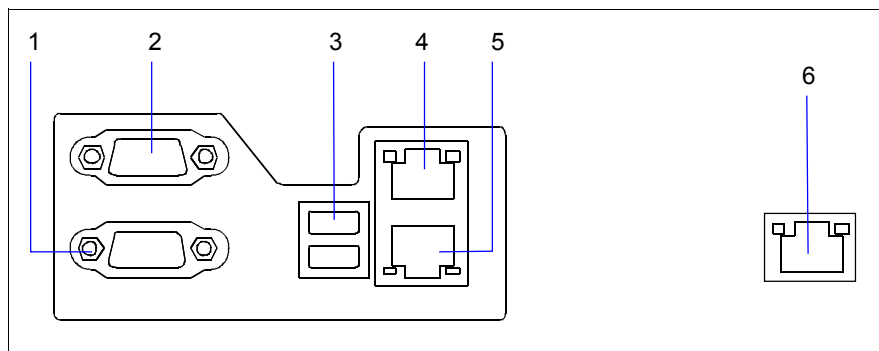
3.6.1 External connectors

Figure 8: External connectors I/O shield

1 = Video connector

2 = Serial connector

3 = Dual USB connector

4 = LAN 1

5 = LAN 2

6 = GCM connector (not used)

LAN connectors

On this system board you will find one GbE Broadcom LAN controller 5704C. This LAN controller supports the transfer rates of 10 Mbit/s, 100 Mbit/s and 1 Gbit/s. The LAN controller supports WOL function through Magic Packet™.

It is also possible to boot a device without its own boot hard disk via LAN. Here Intel PXE is supported.

The LAN controller connectors are equipped with two LEDs (light emitting diode) indicating the transfer rate and the activity.

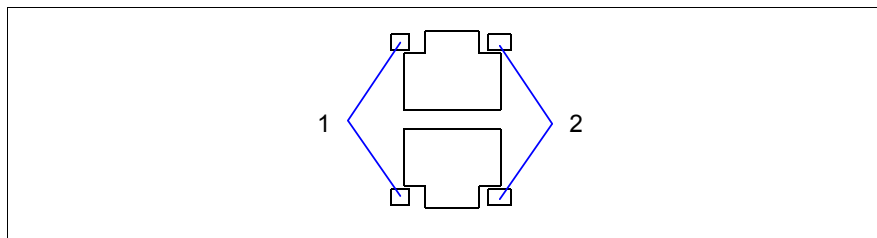


Figure 9: LAN connectors

1	LAN link/aktivty	green	on	LAN connection
			off	no LAN connection
			flashing	LAN transfer
2	LAN transfer rate		off	transfer rate 10 Mbit/s (or no connection)
		green	on	transfer rate 100 Mbit/s
		orange	on	transfer rate 1000 Mbit/s

3.7 RoMB

The onboard Intel® IOP332 I/O processor becomes a RAID5 (RAID 0, 1, 5, 10, 50) controller by using a RAID activation key and a cache module. The following figure shows the installed components.

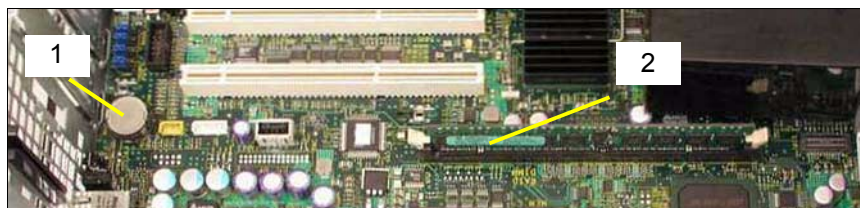


Figure 10: RoMB; 1=RAID activation key, 2=cache module

4 Replacing the lithium battery

In order to save the system information permanently, a lithium battery is installed to provide the CMOS-memory with a current. When the charge is too low or the battery is empty, a corresponding error message is provided. The lithium battery must then be replaced.



The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

Make sure that you insert the battery the right way round. The plus pole must be on the top!

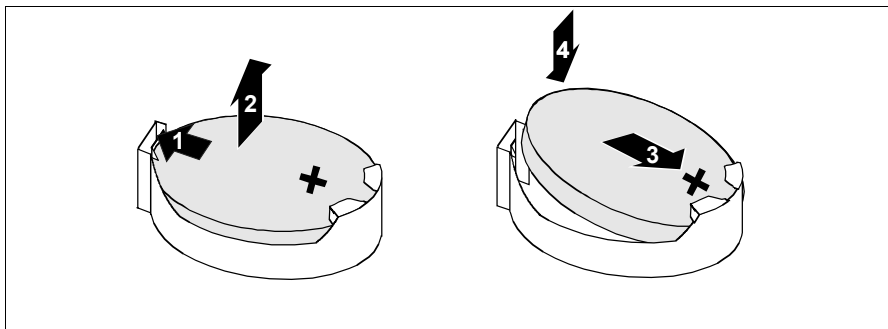


Figure 11: Replacing the lithium battery (holder is similar)

- ▶ Remove the memory board in connector A (for description see the Operating Manual of your server, chapter "Hot-plug Components").
- ▶ Press the locking spring into direction of the arrow (1), so that the lithium battery jumps out of its socket.
- ▶ Remove the battery (2).
- ▶ Insert a new lithium battery of the same type into the socket (3) and (4).
- ▶ Reinstall the memory board in connector A.

Abbreviations

The technical terms and abbreviations given below represent only a selection of the full list of common technical terms and abbreviations.

Not all technical terms and abbreviations listed here are valid for the described system board.

AC

Alternating Current

ACPI

Advanced Configuration and Power management Interface

ANSI

American National Standards Institute

ASR&R

Automatic Server Recovery and Restart

ATA

Advanced Technology Attachment

BBU

Battery Backup Unit

BIOS

Basic Input Output System

BMC

Baseboard Management Controller

CMOS

Complementary Metal Oxide Semiconductor

COM

COMmunication port

CPU

Central Processing Unit

Abbreviations

DDR

Double Data Rate

DIMM

Dual In-line Memory Module

DIP

Dual In-line Package

DMI

Desktop Management Interface

DRAM

Dynamic Random Access Memory

ECC

Error Correction Code

EEPROM

Electrical Erasable Programmable Read Only Memory

EFI

Extensible Firmware Interface

EGB

Elektrostatisch gefährdete Bauteile

EMI

Electromagnetic interference

EMRL

Embedded RAID Logic

EMV

Elektromagnetische Verträglichkeit (electromagnetic compatibility)

EPROM

Erasable Programmable Read Only Memory

ESD

ElectroStatic Discharge

EVRD

Enterprise VRD

HPC

Hotplug Controller

FPC

Front Panel Controller

FRU

Field Replaceable Unit

FSB

Front Side Bus

ICE

In Circuit Emulation

IDE

Integrated (intelligent) Drive Electronics

IEC

International Electrotechnical Commission

IME

Integrated Mirroring Enhanced

IOOP

Intelligent Organisation Of PCI

IPMB

Intelligent Platform Management Bus

IPMI

Intelligent Platform Management Interface

ISO

International Organisation for Standardisation

LAN

Local Area Network

Abbreviations

LED

Light Emitting Diode

MPS

Multi Processor Specification

NMI

Non Maskable Interrupt

OEM

Original Equipment Manufacturer

OHCI

Open Host Controller Interface

OS

Operating System

PCI

Peripheral Components Interconnect

PDA

Prefailure Detection and Analyzing

PIO

Programmed Input Output

PDB

Power Distribution Board

PLD

Programmable Logic Device

PS(U)

Power Supply (Unit)

PWM

Pulse Wide Modulation

PXE

Preboot eXecution Environment

RAID

Redundant Array of Inexpensive Disks

RoHS

Restriction of the Use of Certain Hazardous Substances (Waste from Electric and Electronic Equipment, EU Directive)

RoMB

RAID on Motherboard

RSB

Remote Service Board

RST

ReSeT

RTC

Real Time Clock

SCSI

Small Computer Systems Interface

SATA

Serial Advanced Technology Attachment

SDDC

Single Device Data Correction

SDRAM

Synchronous Dynamic Random Access Memory

SEL

System Event Log

SHDG

Server Hardware Design Guide

SMB

System Management Bus

SMM

Server Management Mode

Abbreviations

SMP

Symmetrical Multi Processing

UHCI

Unified Host Controller Interface

USB

Universal Serial Bus

VGA

Video Graphics Adapter

VRD

Voltage Regulator Down

VRM

Voltage Regulator Module

WEEE

Waste from Electric and Electronic Equipment (EU Directive)

WfM

Wired for Management

WOL

Wake up On LAN

Fujitsu Siemens Computers GmbH
User Documentation
33094 Paderborn
Germany

Fax: (++49) 700 / 372 00001

e-mail: manuals@fujitsu-siemens.com
<http://manuals.fujitsu-siemens.com>

Submitted by

Comments
Suggestions
Corrections

Comments on System Board D2352
for TX600 S3/RX600 S3





Information on this document

On April 1, 2009, Fujitsu became the sole owner of Fujitsu Siemens Computers. This new subsidiary of Fujitsu has been renamed Fujitsu Technology Solutions.

This document from the document archive refers to a product version which was released a considerable time ago or which is no longer marketed.

Please note that all company references and copyrights in this document have been legally transferred to Fujitsu Technology Solutions.

Contact and support addresses will now be offered by Fujitsu Technology Solutions and have the format ...@ts.fujitsu.com.

The Internet pages of Fujitsu Technology Solutions are available at

[http://ts.fujitsu.com/...](http://ts.fujitsu.com/)

and the user documentation at <http://manuals.ts.fujitsu.com>.

Copyright Fujitsu Technology Solutions, 2009

Hinweise zum vorliegenden Dokument

Zum 1. April 2009 ist Fujitsu Siemens Computers in den alleinigen Besitz von Fujitsu übergegangen. Diese neue Tochtergesellschaft von Fujitsu trägt seitdem den Namen Fujitsu Technology Solutions.

Das vorliegende Dokument aus dem Dokumentenarchiv bezieht sich auf eine bereits vor längerer Zeit freigegebene oder nicht mehr im Vertrieb befindliche Produktversion.

Bitte beachten Sie, dass alle Firmenbezüge und Copyrights im vorliegenden Dokument rechtlich auf Fujitsu Technology Solutions übergegangen sind.

Kontakt- und Supportadressen werden nun von Fujitsu Technology Solutions angeboten und haben die Form ...@ts.fujitsu.com.

Die Internetseiten von Fujitsu Technology Solutions finden Sie unter

[http://de.ts.fujitsu.com/...](http://de.ts.fujitsu.com/), und unter <http://manuals.ts.fujitsu.com> finden Sie die Benutzerdokumentation.

Copyright Fujitsu Technology Solutions, 2009